REMARKS/ARGUMENTS

Claims 1 to 6 and 8 to 20 are now in the application.

The present application discloses a keyboard with movable keys for accommodating handicapped users. The keyboard contains a set of movable keys. Any one of these keys can be placed in any one of a plurality of key receptors in the keyboard. The keycap of each of these keyboard keys is marked with its alphanumeric or functional symbol. Each key contains a unique self-defining binary indicator that is unique to the symbol on the keycap of the key and accompanies the key into any of the key receptor positions of the keyboard. A matrix of key sensing circuits underlies the key receptor positions of the keyboard. Each key sensing circuit is configured to detect the indicator on any of the keys irrespective of the receptor position of the key in the keyboard. When a key is depressed, the matrix provides an output to a keyboard controller identifying the depressed keys binary indicator. The keyboard controller in turn provides key signals to the keyboard's connector that are indistinguishable by a computer system from the output of that key if it were in its assigned QWERTY keyboard position or any other keyboard position. This enables the disabled user to modify key positions on the keyboard to accommodate the users disability and carry this modified keyboard from one computer system to another and simply exchange it for the standard keyboard for the computer. Except for positioning the keys in those positions selected by the user, no changes are required to be made to any software or hardware of the computer or the keyboard in order to allow the disabled user to use the computer. Furthermore, other users are not required to reconfigure the computer system after a QWERTY configured keyboard has been reinstalled.

Rejections under 35 USC §103

A.   Claims 1 to 5, 9 to 14 and 17 are rejected under 35 USC §103(a) as being unpatentable over Willner, U.S. patent #5,790,103 in view of Boldridge et al U.S. Patent #4,712,092 further in view of Fukui, UP61-221922.

As pointed out above, the keys in the keyboard of the present application are movable from keyboard position to keyboard position and carry an identifying indicator along with them. Underlying the receptor positions of the keyboard is a matrix of detectors which detect the identifying binary indicators of any one of the movable keys no matter what position that key is placed in the keyboard. The combination of these movable keys with a matrix capable of detecting indices on the keys, irrespective of the keys in the keyboard, enables the key of the keyboard to be easily reconfigured to accommodate the users disability. No knowledge or other modification of the keyboard or computer hardware or software is needed for a disabled user or his/her helper to position the movable keys in their desired position.

None of the references in the combination cited by the Examiner shows either the keys that contain binary indicators movable with the key in combination with a matrix that can detect the indicator without further modification of the keyboard hardware or software.

The Examiner suggests the keys of the Boldridge patent be implemented in the Willner apparatus. The Examiner points out that the keys in either the Boldridge or Willner are incapable of being repositioned in the keyboard. Furthermore as pointed out previously, the Boldridge keys do not contain an indicator identifying to the matrix the function of the key being pressed. Each of the keys of the Boldridge patent contains an unmarked plunger with an identical percussion tip 20 which strikes plate

30 attached to the matrix element 32 through a mask 37 which
contains a key identification pattern. Therefore even if the
keys of Boldridge could be moved from one position to another,
they would not carry with them an identifying binary indicator as
described in the present application. In order to change the
position of the keys, a new mask 21 is required that reflects the
reorientation of the keys. In other words, a very large set of
different masks is required, one for each possible combination of
key positions.

The addition of the teaching of the Fuki reference to that
of the combination of Willner and Boldridge does not provide for
keys capable of being positioned in any key position; in Fuki
only the keycaps are changed. The functioning of the keyboard in
Fuki cannot be changed merely by changing the keycap. The use of
the relegendable keyswitches in Fuki requires rewriting of the
key codes for the keys. Therefore, the teaching of Fuki not only
fails to make the immobile keys of Boldridge mobile but using
Fuki key caps on Boldridge keys would require changing the mask
of Boldridge to reflect the new key positioning. An unreasonably
large set of key defining masks would be required to accommodate
all possible configurations of different key positions in the
keyboard. The necessity of changing masks would discourage those
skilled in the art from making the changes suggested by the
Examiner since it would require disassembly of the keyboard and
require an unreasonably large set of masks to accommodate placing
the keys in different positions.

It should be apparent from the above discussion that the
patents of the combination, either alone or in combination, do
not disclose keys which are movable from one position to another
position in the keyboard carrying with them a binary coded
indicator in combination with a matrix capable of detecting the
coded indicator irrespective of their key positions in the
matrix. As a result, the positions of keys in the keyboard are
transparent to the computer thereby enabling the movement of keys

to keyboard positions preferable by the user without requiring mechanical or electronic changing of the keyboard or the computer.

Claims 1 to 5, 9 to 14 and 17 in the application all are patentable over the prior art combination, set forth in paragraph A, for the above and other reasons. For instance, independent claim 1 calls for keys that each contain a multi-bit binary code therein and are capable of being positioned in any one of the positions in the keyboard. Previously added independent claim 10 calls for the keys being movable so that any key and its character identifiable code can be placed in any key position and also calls for a circuit matrix capable of detecting the binary code when one of the keys is contacted. The dependent claims further distinguish over the prior art in that they call for additional structure relating to the invention. For instance, claim 17 claims structure for the keys which enables movement of the keys from one keyboard position to another without disassembly of the keyboard or movement of adjacent keys.

B. Claims 6 and 15 are rejected under 35 USC §103(a) as being unpatentable over the Willner, Boldridge, and Fuki combination in view of Alexander, U.S. Patent 3,706,905.

Applicant's attorney did not see where the Alexander keys are movable keys containing a coded indicia that conveys binary signals to an uncoded matrix. Therefore Alexander does not alleviate the problems existing in the combination cited with respect to claims 1 and 10. Therefore claims 6 and 15 distinguish over the prior art for the reasons given above.

C. Claims 8 and 16 were rejected under 35 USC §103(a) as being unpatentable over the Willner, Boldridge, and Fukui or combination in view of Cherry, U.S. Patent 4,529,848.

Applicant's attorney cannot see where the addition of Cherry matrix switches overcomes the problems existing in the combination used in rejection of the independent claims 1 and 10.

D.   Claim 18 is rejected under 35 USC §103(a) as being unpatentable over Willner, Boldridge, Fuki and Cherry in view of Taylor, and Claim 20 is rejected under 35 USC §103(a) as being unpatentable over Willner in view of Boldridge, Fuki and Taylor.

The failure of the patents of this combination to teach applicant's invention have been discussed extensively above and do not have to be repeated again. Therefore, claims 18 and 20 distinguish over the prior art for reasons given above in section A. Further all the claims call for a separate key position for each of the alphabetic character. The keyboard in the Willner patent does not have a separate key position for each alphabetic character.

It should be apparent from the above discussion that the patents in the cited combinations do not show critical elements recited in the claims. Furthermore, there is no suggestion to combine or modify the cited references in the prior art, as proposed by the Examiner. With this lack of prior art teaching, it appears to applicant's attorney that the Examiner has used hindsight to assemble his combinations, using the claims of the present application as recipes and selecting references of the prior art as ingredients for the recipe. It turns out the resulting combinations are unlike anything disclosed or claimed in the application and are most likely inoperable since the chosen elements are ill suited or incapable of working together.

Terminal Disclaimer

Since the Examiner's rejection on the basis of double patenting copending application serial number 09/841,686 has issued into patent number 6,696,985. To overcome any objections

to the claims on the basis of double patenting with respect to the claims contained in the aforementioned patent, the applicant's have included a terminal disclaimer in compliance with CFR 1.321(c).

For the above reasons, it is respectfully submitted that all claims are allowable, and the application is in condition for allowance. Therefore it is respectfully requested that it be reconsidered, allowed and passed to issue.

RESPECTFULLY SUBMITTED,

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